Creator of the world's first radio and radio transmitter

ALEXANDER STEPANOVICH POPOV

INTERESTING FACTS

Alexander Stepanovich Popov [4 (16) .3.1859, the village of Turyinsky Rudniki, now Krasnoturinsk, Sverdlovsk Region, 12/31/1905 (13.1.1906), St. Petersburg], Russian physicist and electrical engineer, inventor of wireless electrical communications (radio communications, radio). In 1882 he graduated from the Physics and Mathematics Department of St. Petersburg University and was left in it to prepare for scientific activity. Lecturer in Physics and Electrical Engineering of the Mine Officer Class (1883-1901) and the Technical School of the Maritime Department in Kronstadt (1890-1900); Professor of Physics (since 1901) and Director (since 1905) of the St. Petersburg Electrotechnical Institute. Honorary Electrical Engineer (1900) and Honorary Member of the Russian Technical Society (1901).

The first scientific research of A.S. Popov was devoted to the analysis of the most advantageous action of dynamoelectric machines (1883) and the induction scales of Hughes (1884). After the publication (1888) of the works of G. Hertz on electrodynamics A.S. Popov began to study electromagnetic phenomena and gave a series of public lectures on the topic "The latest research on the relationship between light and electric phenomena". Trying to find a way to effectively demonstrate the experiences of Hertz in front of a large audience, A.S. Popov began designing a more visual indicator of electromagnetic waves (EM) emitted by Hertz by a vibrator. Well aware of the fleet’s need for wireless signaling equipment, it was in the early 90s. He also set himself the task of using EV for signaling. The search for solutions to these problems took place in two stages: finding a sufficiently sensitive indicator of EV; development of a device capable of reliably detecting EM emitted by a Hertz vibrator. As an indicator A.S. Popov chose the radio conductor proposed by the French physicist E. Branly and named later the coherer. Coherer was a small glass tube filled with metal filings with two electrodes at the ends. Under the influence of EV, the electrical resistance of sawdust sharply decreased and the coherer lost sensitivity, but with a slight shaking it was restored again. As a result of painstaking experiments with the coherer A.S. Popov made him a fairly sensitive and convenient indicator of EV. The 2nd stage ended at the beginning of 1895 with the creation of a <device for detecting and recording electric vibrations> - a radio receiver (Fig. 1). It consisted of a coherer connected in series, a polarized relay closing the circuit of an electric bell, and a constant current source - an electric battery. With a decrease in the coherer's resistance (under the influence of an electromagnetic field), the relay worked and included an electric bell. His hammer first hit the bell, and then the coherer, shaking it and thereby returning it to a sensitive state. Thus, immediately after receiving one parcel, the coherer was ready to receive the next one. shaking it and thereby returning it to a sensitive state. Thus, immediately after receiving one parcel, the coherer was ready to receive the next one. shaking it and thereby returning it to a sensitive state. Thus, immediately after receiving one parcel, the coherer was ready to receive the next one.

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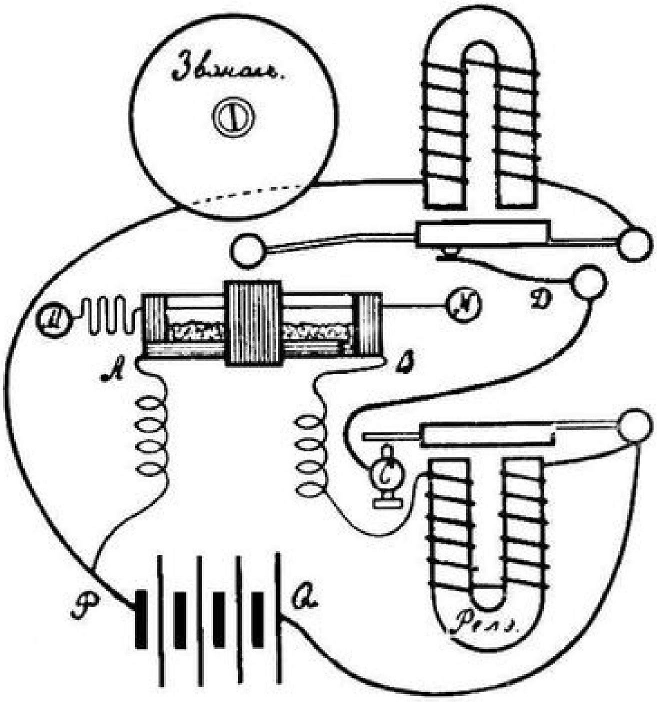

Fig. 1 - Scheme of the radio receiver A.S. Popova: M and N - holders to which the coherer is suspended by means of a light clock spring; A and B are the platinum plates of the coherer, to which the voltage of the electric battery (P-Q) is constantly supplied through a polarized relay (Relay).

By the spring of 1895, Alexander Stepanovich Popov had built a sensitive and reliable receiver suitable for wireless signaling (radio communications). As a transmitter A.S. Popov used a modified Hertz vibrator excited by a Rumkorf coil. To the ends of the rods of the vibrator A.S. Popov attached square metal sheets measuring 40x40 cm. The alarm was made by a switch (key) in the power supply circuit of the Rumkorf coil. In the first experiments on radio communications carried out in a physical office, and then in the garden of the Miner's officer class, the receiver detected radiation of radio signals sent by the transmitter at a distance of up to 60 m. When conducting experiments A.S. Popov noticed that connecting a vertical metal wire (antenna) to the coherer led to an increase in the distance of reliable reception. On April 25 (May 7), 1895, at a meeting of the Physical Department of the Russian Physico-Chemical Society, Alexander Stepanovich Popov made a scientific report on his invention of a wireless communication system and demonstrated its operation; on the contents of the report A.S. Popov was published in the newspaper Kronstadt Bulletin dated April 30 (May 12), 1895, in the Journal of the Russian Physicochemical Society, 1895, v. 27, c. 8, part physical, and in the same place, 1896, v. 28, c. 1, the physical part. 1896, t. 28, c. 1, the physical part. 1896, t. 28, c. 1, the physical part.

During experiments in 1895, Popov discovered that his receiver also responded to lightning discharges. Therefore, Alexander Stepanovich built a special device that records signals on a moving paper tape caused by electromagnetic radiation from thunderstorms. This device, later called a lightning detector, was used by him in 1895-96 to study the nature of atmospheric interference. Popov's receiver and Popov's lightning detector (Fig. 2) are stored in the Central Museum of Communications in Leningrad.

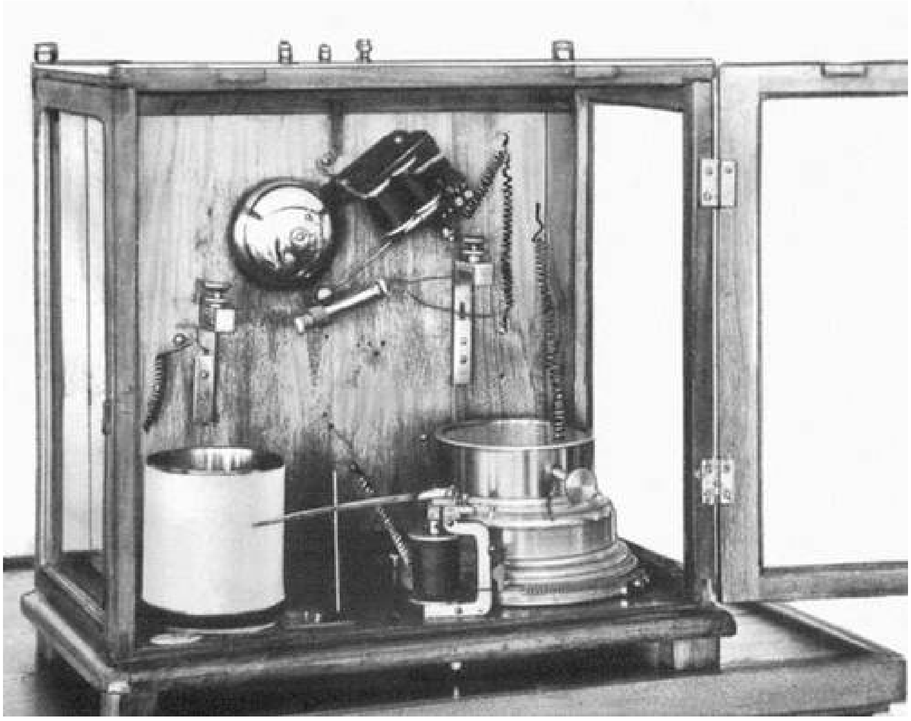

Fig. 2 - Appearance of a light detector A. S. Popov

In 1895-96, Alexander Stepanovich Popov was engaged in the improvement of the devices he created, made reports and showed their work. In the spring of 1897, in experiments in the Kronstadt harbor, Popov reached a radio communication range of 600 m, and in the summer of 1897, when tested on ships, 5 km. At this time, he discovered that metal ships influence the propagation of electronic warfare and proposed a way to determine the direction of a working transmitter. During the experiments in 1897 A.S. Popov used electronic devices lying on the border of the decimeter and meter ranges.

The work of Popov on the study of x-rays dates back to the same time; he made the first x-ray photographs of human subjects and limbs in Russia.

In 1899 A.S. Popov, N. Rybkin and D.S. Troitsky - Popov's assistants - discovered the coherer detection effect. Based on this effect, Popov built a <telephone receiver despatch> for the auditory reception of radio signals (to head phones) and patented it (Russian privilege N 6066 from 1901). Receivers of this type were produced in 1899-1904 in Russia and France (Ducrette company) and were widely used for radio communications. At the beginning of 1900, Popov's devices were used for communication during the liquidation of the accident of the battleship "General Admiral Apraksin" near the island of Gogland and during the rescue of fishermen carried away on an ice floe in the sea. At the same time, the communication range reached 45 km. In 1901, Popov Alexander Stepanovich in real ship conditions received a communication range of 148-150 km.

The works of Alexander Stepanovich Popov were highly appreciated by his contemporaries in Russia and abroad: for example, Popov's receiver was awarded the Big Gold Medal at the 1900 World's Fair in Paris. Special recognition of the merits of A.S. Popov was a decree of the Council of Ministers of the USSR, adopted in 1945, which established Radio Day (May 7) and established a gold medal named after A.S. Popov, awarded by the USSR Academy of Sciences for outstanding works and inventions in the field of radio. The name of Alexander Stepanovich Popov is: Communications School in Kronstadt, Higher Naval School in Leningrad, Odessa Electrotechnical Institute of Communications, Central Museum of Communications, Scientific and Technical Society of Radio Engineering, Electronics and Communications, the street in Leningrad where he lived, and many others.

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